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Via email: HarborComments@epa.gov

Attn: Portland Harbor Superfund Comments
U.S. Environmental Protection Agency
805 SW Broadway, Suite 500
Portland, OR 97205

Re: NW Natural Comments on Proposed Explanation of Significant Differences
Portland Harbor Superfund Site

Dear Environmental Protection Agency:

NW Natural appreciates the opportunity to submit these comments on EPA's *Proposed Explanation of Significant Differences, Portland Harbor Superfund Site, Portland, Oregon* (October 2018). We are pleased that EPA has moved quickly to incorporate its updated *Toxicological Review of Benzo(a)pyrene* (January 19, 2017) into the Portland Harbor Record of Decision before significant resources were spent implementing outdated cleanup values. We do, however, have some concerns about the proposed ESD, and we request that EPA modify the proposed ESD to be consistent with the remedy selected in the Record of Decision for the Portland Harbor Site.

A brief summary of our comments, together with our requested revisions to the proposed ESD, follows:

- *Nearshore PAH Remedial Action Levels should be revised proportionally to the updated cleanup level for direct contact with cPAHs (RAO 1)*. The ROD establishes an interim target for human health direct contact risk of 1 x 10^{-5} from all chemicals at the completion of construction of active remedies and then selects monitored natural recovery as the response action through which final cleanup levels will be achieved.[1] The proposed ESD eliminates MNR as a component of RAO 1 cPAH remedies by establishing nearshore PAH RALs that achieve final RAO1 cPAH cleanup levels in every area of the site immediately upon the conclusion of construction. Because the nearshore RAL is set to achieve final cleanup levels at construction completion at 100% of nearshore rolling half river mile segments, large areas of the site will be subjected to active remedies based on PAH RALs where the RAO 1 interim target is already met, including some areas where EPA's calculations show that no actual cPAH risk is present at the updated cleanup level. This is a fundamental change from the remedy selection criteria employed in the FS and the ROD.

[1] ROD, Table 22. *See also, Portland Harbor Feasibility Study* (EPA, June 2016), p. 4-6

Requested revision: EPA should revise the PAH RALs proportionally to the updated cleanup levels. EPA's June 2016 FS evaluations demonstrate that nearshore PAH RALS as high as 170,000 ppb would meet the cPAH interim target for RAO 1 of 1 x 10^{-5} throughout the site. [2] *Proportional revision of the PAH RALs would maintain MNR as a component of the RAO 1 remedy and be consistent with the FS and the ROD.*

- *The Site meets the shellfish consumption interim target at the "no action" level, and no PAH cleanup in the navigation channel is necessary to reduce risk from shellfish consumption (RAO 2).* EPA's baseline human health risk assessment identified no human health risk from clams harvested within the navigation channel, based upon the assumption that clam harvesting would occur only in nearshore areas with accessible water depths.[3] Neither the ROD nor the ESD explain why EPA diverged from the risk assessment by finding that clams were likely to be harvested and consumed from the bottom of the navigation channel.

  Regardless, the ROD establishes an interim target for RAO 2 of 1 x 10^{-4} on a sitewide basis.[4] EPA's FS and ROD evaluations calculate sitewide cPAH concentrations at the "no action" level at 1,489.1 µg/kg, just above the updated 1076 µg/kg cPAH final cleanup level for RAO 2.[5] The contribution of PAH RALs in the navigation channel to attainment of EPA's interim target for RAO 2 is therefore essentially nonexistent, except to the extent that a cleanup area established using a PAH RAL may sweep up co-located non-petroleum chemicals contributing to fish consumption risk. If other chemicals are posing unacceptable risk from fish consumption, EPA should select remedies on that basis explicitly instead of using the PAH RAL to address them.

  Requested revision: Any concern about limited interim risk based on shellfish consumption could be addressed in the ESD through EPA's clarification that institutional controls prohibiting clam harvesting are an appropriate alternative to dredging in in the navigation channel. EPA should not require extensive dredging in the navigation channel to address chemicals that are irrelevant to attaining EPA's RAO 2 protectiveness criteria.

- *The Site surface water meets Oregon water quality standards applicable to cPAHs at the "no action" level, and no PAH cleanup is necessary to protect surface water (RAO 3).* The proposed ESD states, "The BaP [cancer slope factor] change is not expected to result in a change to Oregon water quality standards in the foreseeable future. As a result, the ARAR based surface water CULs specified in Table 17 of the ROD have not been modified." The most stringent benzo(a)pyrene Oregon water quality standard (human health water + organism consumption) is .0013 µg/l. EPA's ROD shows maximum

[2] ROD, Appendix IV Table J2.2-1c (Alternative B)
[3] EPA Comments on Comprehensive Round 2 Site Summary and Data Gaps Analysis Report (January 15, 2008), p. 26.
[4] ROD, Table 22.
[5] ROD, Appendix IV, Table J2.3-7

predicted cPAH surface water concentrations at the "no action" level at just over .0012 µg/l.[6]

ROD Table 17 sets the cPAH surface water cleanup level at .00012 µg/l based not on the Oregon water quality standard but on the National Recommended Water Quality Criteria for benzo(a)pyrene. NRWQC are not applicable to CERCLA cleanups but may be relevant and appropriate at some sites. The .00012 µg/l benzo(a)pyrene NRWQC, which is based on outdated cancer slope factors, no longer represents good science and is no longer relevant or appropriate to RAO 3 (reduce cancer and non-cancer risks to people from surface water at the site).[7]

Requested revision: EPA should update the cPAH cleanup level in ROD Table 17 to the applicable Oregon water quality standard. Because EPA's analysis shows this standard is met at the no action level, no PAH cleanup is necessary to meet RAO 3.

- *Consistent with the ROD, PAH RALs should not be used to define active remediation to address benthic risk (RAO 5)*. In the ROD, EPA set an interim target for RAO 5 of addressing 50% of the area of the site exceeding 10 times the cleanup level at the end of construction.[8] The remaining 50% of benthic risk areas are allowed to naturally recover.[9] The ESD explicitly rejects any PAH RAL above 170,000 µg/kg because it "may affect the ability of the Selected Remedy to achieve the total PAH CUL of 23,000 µg/kg for protection of the benthic community."[10] Simple math shows that any PAH RAL below 230,000 µg/kg will address all areas exceeding 10 times the PAH cleanup level at construction completion, eliminating any MNR component from the remedy. This is a fundamentally different remedy for RAO 5 than selected in the ROD.

  The PAH RALs developed to define active remedies based on RAOs 1 and 2 were never intended to target RAO 5 risks. There is no rational connection between the RALs and EPA's interim target for RAO 5, and EPA should not apply PAH RALs in the navigation channel.

  Requested revision: At a minimum, EPA should clarify that during remedial design, areas of benthic toxicity for which active remediation is required will be further defined through the multiple lines of evidence, such as benthic toxicity testing, used in the Baseline Ecological Risk Assessment.[11]

The revisions we are requesting to the proposed ESD would have minimal effect on the Gasco Sediments project area, and we want to be absolutely clear that we are proceeding

[6] ROD Appendix IV, Figure 4.2-8b.
[7] *ARARs Q's & A's: Compliance with Federal Water Quality Criteria* (EPA, June 1990) ("Prior to using an FWQC for a particular constituent, RPMs should consult the IRIS data base ... to ensure consideration of the latest available scientific information.")
[8] ROD, Table 22.
[9] ROD Responsiveness Summary, page 2-217.
[10] Proposed ESD, p. 26
[11] See, ROD Responsiveness Summary, p. 2-218

expeditiously with remedial design under the existing ROD on the schedule set out in the 2009 Administrative Settlement Agreement and Order on Consent between EPA and NW Natural. The requested revisions could, however, limit litigation among responsible parties over the sources of relatively low level petroleum contamination in other areas of Portland Harbor that present little or no risk based on the best available science, thereby focusing the parties' resources on cleanup and avoiding delay while remaining consistent with the basic features of the ROD, including the use of interim targets to evaluate protectiveness and the reliance on MNR to attain final cleanup levels.

Our detailed comments are provided below.

COMMENTS ON THE PROPOSED EXPLANATION OF SIGNIFICANT DIFFERENCES

Under the National Contingency Plan, an ESD is appropriate where EPA adjusts the remedial action in ways that "significantly change but do not fundamentally alter the remedy selected in the ROD with respect to scope, performance, or cost."[12] An ESD is the correct administrative procedure to conform cleanup levels and criteria to updated Integrated Risk Information System (IRIS) toxicity values, because the updated values maintain the same measure of protectiveness as the original ROD.

IRIS "represents the official Agency scientific position regarding the toxicity of the chemicals based on the data available at the time of the review."[13] When selecting remedial goals, EPA site managers should "[u]se the most current toxicity values provided by the Integrated Risk Information System (IRIS) or the Health Effects Assessment Summary Tables (HEAST)."[14] After a remedy is selected, EPA guidance directs site managers to review existing cleanup levels against updated IRIS values. "It is EPA's policy to encourage appropriate remedy changes in response to advances in remediation science and technology."[15] EPA "recognizes that some remedy decisions made at Superfund sites in the past should be modified to bring those decisions up to date with the current state of the science."[16] EPA has used ESDs at many other sites to recalculate cleanup levels based on updated IRIS values.[17]

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[12] 40 C.F.R. § 300.435(c)(2)(i).
[13] *Id*.
[14] *Rules of Thumb for Superfund Remedy Selection*, OSWER 9355.0-69 (August 1997), p. 6.
[15] *A Guide to Preparing Superfund Proposed Plans, Records of Decision and Other Remedy Selection Decision Documents,* EPA 540-R-98-031 (July 1991), p. 7-1.
[16] *Superfund Reforms: Updating Remedy Decisions*, EPA 540-F-96-026 (September 1996), p. 2.
[17] *See, e.g.* Salem Acres (Salem, MA) January 1998 ESD (revising cPAH cleanup levels based upon updated B(a)P IRIS values ("benzo(a)pyrene less potent than it was believed when the ROD was written"); Burlington Northern Somers Plant (Somers, Montana) July 1998 ESD (revising soil remediation level for cPAHs from 36 to 57 ppm B(a)Peq based upon revised B(a)P cancer slope factor); Petrochem Recycling Corp (Salt Lake City, Utah) March 1999 ESD (updating soil performance standard for PCBs from 0.15 ppm to 2.7 ppm based upon updated IRIS slope factors); Commencement Bay November 1997 ESD (updating PCB cleanup levels for multiple reasons, including new toxicity information and updated exposure assumptions).

Where EPA seeks to "fundamentally alter the basic features of the selected remedy with respect to scope, performance, or cost," however, EPA must do so by amending the ROD.[18] Here, the proposed ESD goes beyond merely updating the cPAH cleanup level and associated RALs to make wholesale changes in the manner in which EPA's ROD combines active remedies and natural recovery to achieve protectiveness. And EPA is making these fundamental changes in the scope of its selected remedy for cPAHs and PAHs alone among the dozens of chemicals found to present unacceptable risk at Portland Harbor.

1. Selection of active remediation areas to achieve final cleanup levels at construction completion is a fundamental change to the selected remedy.

The NCP requires EPA to evaluate and compare remedial alternatives against nine criteria. 40 CFR 300.430(e)(9). Two of these criteria, overall protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs), are "threshold" criteria that must be met for an alternative to be carried forward for further comparison. In the Portland Harbor FS and ROD, EPA evaluated overall protectiveness and ARARs by reference to "interim targets" to be met at completion of construction of active remedies. EPA expected final cleanup levels to be achieved through monitored natural recovery.

> As a long-term model is not available to predict the time to meet the PRGs, interim targets for risks and HIs were established to evaluate the potential for achievement of PRGs in a reasonable time frame, which was considered to be 30 years, commensurate with the site-specific contaminants and conditions. These interim targets are higher than residual risks once PRGs are achieved, and assume that further reductions with [sic] be achieved through MNR. Because the primary mechanism for MNR is through deposition, MNR is likely to be effective in the shortest amount of time in depositional environments after source control actions and active remediation of any sediment posing the highest risks have been completed (USEPA 2005). However, the majority of the Site is transitional; depositional during low flows and erosional in higher flows, which the exception of RM 11E and in the navigation channel at RM 6 that are erosional under all flow conditions. Further, the establishment of interim targets is consistent with EPA's Contaminated Sediment Guidance. Therefore, the protection of human health and the environment is assessed for each RAO by evaluating achievement of interim targets at the end of construction, as well as any additional benefit provided by measures that further reduce exposure risks such as ICs.[19]

[18] 40 C.F.R. § 300.435(c)(2)(ii). *See also, United States v. NCR Corp.*, 911 F. Supp. 2d 767, 774 (E.D. Wis. 2012), *aff'd sub nom. United States v. P.H. Glatfelter Co.*, 768 F.3d 662 (7th Cir. 2014) (amendment required for change to "basics" of the remedy).

[19] *Portland Harbor Feasibility Study* (EPA, June 2016) ("EPA FS"), p. 4-6.

For RAO 1 (human health direct contact), EPA chose to evaluate protectiveness against an interim target of 1 x 10^{-5} cumulative post-construction risk.[20] EPA then selected active remedies, delineated through the application of PAH and other RALs, that met this interim target and selected MNR to attain final cleanup levels.[21]

The proposed ESD instead selects areas for active remediation of nearshore petroleum contamination by "achieving the updated direct contact cPAH CUL of 774 µg/kg as measured on one-half rolling river mile [surface area weighted average concentrations (SWACs)] throughout the Site" at "100% of the nearshore half-river miles" at the completion of construction.[22] This is a fundamentally different remedy than selected in the ROD, because it entirely eliminates MNR as a component of RAO 1 cPAH remedies (and only cPAH remedies).

The proposed ESD did not evaluate any alternative PAH RALs against the interim target of 1 x 10^{-5} post-construction cumulative risk. If EPA intended merely to update its selected remedy consistent with the IRIS update, EPA, at a minimum, should have compared cumulative risks using PAH SWACS calculated for all alternatives evaluated in the FS against the interim targets adopted in the ROD. Instead, EPA simply compared post-construction cPAH SWACs to the updated cPAH cleanup level. ROD Appendix IV Table J2.2-1c readily shows that a PAH RAL as high as 170,000 µg/kg (FS Alternative B) would reduce cPAH concentrations below 1 x 10^{-5} (7,740 µg/kg) in all nearshore half-river miles. The figures below, modeled after proposed ESD Figures 4a and 4b, show this graphically. [23]

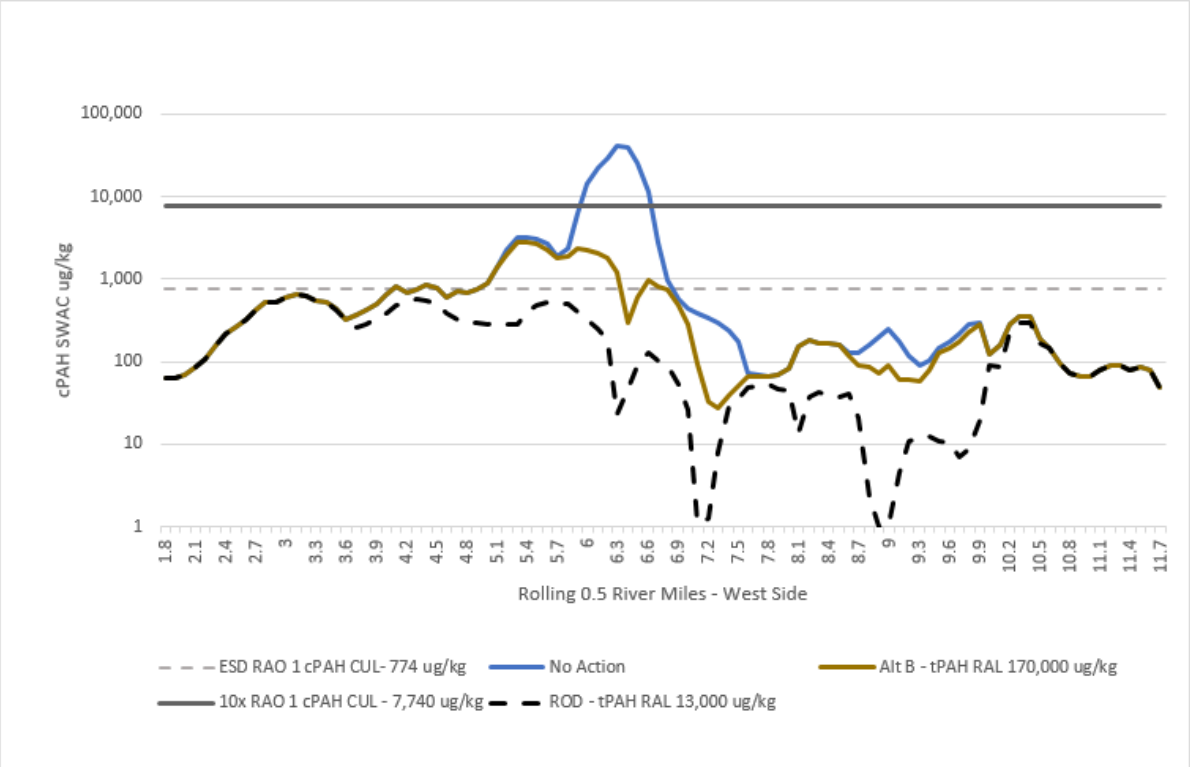
[20] ROD, Table 22

[21] *See*, Proposed ESD, p. 16 ("The Selected Remedy addresses all areas where contaminant concentrations exceed the CULs through a combination of dredging, capping, enhanced natural recovery (ENR), monitored natural recovery (MNR), and institutional controls.")

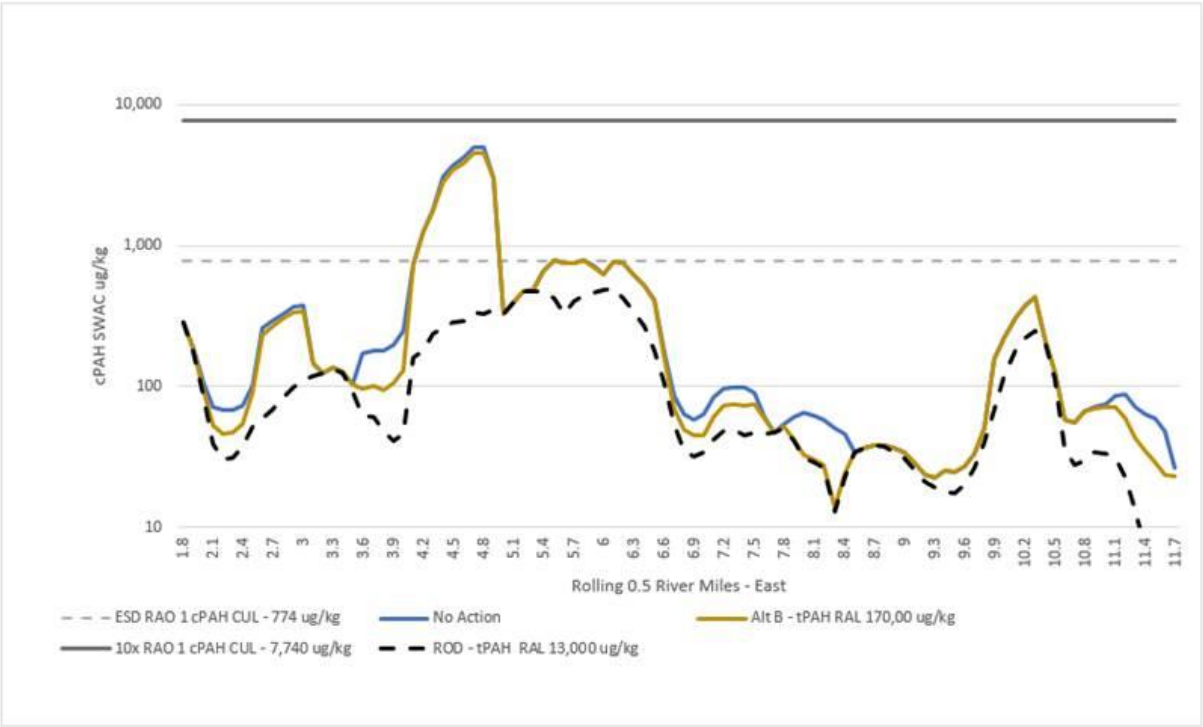
[22] Proposed ESD, p. 24.

[23] Our figures were plotted using data from ROD Appendix IV Table J2.2-1c. We do not know the source of the data plotted on proposed ESD Figures 4a and 4b, but the 13,000 µg/kg (F-Mod) lines on those figures do not match the post-construction SWACs presented in the ROD.

Post Construction SWACs RAO 1 – EPA App J 0.5 RM - West Side



Post Construction SWACs RAO 1 – EPA App J 0.5 RM - East Side



Indeed, as ROD Appendix IV Table J2.2-1c shows, only seven half-river miles exceed 7,740 µg/kg at the "no action" (Alternative A) condition, and many areas identified for active remedies based on PAH RALs in the ESD would meet or approach the final cPAH cleanup level at PAH RALs significantly higher than the RAL selected in the proposed ESD.[24] Proposed ESD Figure 8, for example, shows an area of active remedy defined by the proposed 30,000 g/kg PAH RAL at approximately RM 3.8W; according to ROD Appendix IV Table J2.2-1c, all west bank half-river miles downstream of RM 4W already meet the final cleanup level at the "no action condition."[25]

If the proposed ESD were a ROD amendment, the divergence, without explanation, from EPA's previous selection of a remedial approach that combined active remedies with MNR, and without comparison of a range of alternatives against the full nine criteria would have been inconsistent with the NCP and arbitrary and capricious.[26] EPA has not explained why it is proposing response actions for petroleum contamination that are far more aggressive than for any other hazardous substance present at the Site and has not provided any analysis of whether those actions are cost-effective or even necessary.[27] This is an absurd outcome at a site where EPA has concluded that "health risks from consumption of fish are 100 times or more greater than any other risks evaluated at Portland Harbor. The majority of these risks are due to PCBs…."[28] And it is a very odd conclusion given that PAHs degrade more quickly in the environment than any of the other primary risk drivers (PCBs, pesticides and dioxins).[29]

It may be that EPA has concluded that low nearshore PAH RALs remain necessary to capture risk associated with other chemicals and other RAOs. For example, EPA identified an RAO 2 risk-based PRG of 0 µg/kg for PCBs.[30] EPA's site wide PCB RAL is 75 µg/kg.[31] Areas of the site that do not exceed cPAH interim target concentrations, or even present unacceptable risk from cPAHs, based upon the updated IRIS cancer slope factor might nonetheless contribute to RAO 2 risks because of PCB concentrations between 0 and 75 µg/kg, and smaller areas of active remedy defined by PAH RALs might therefore affect the ability of EPA's ROD as a whole to meet the RAO 2 interim target due to PCB risk. If this is the basis for EPA not proportionally adjusting the PAH RALs to reflect the updated IRIS cancer slope factor, EPA should say so explicitly, and should show its analyses to reach this conclusion. A fair allocation of response costs among

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[24] We do not understand how EPA generated Figure 5 in the proposed ESD or the conclusion that a "total PAH RAL of 95 mg/kg protects 22% of the nearshore areas." Proposed ESD, p. 24. ROD Appendix IV Table J2.2-1c shows that rolling river mile average concentrations of cPAHs (0.5 mile increments) are below the 774 µg/kg updated cleanup level in approximately 86% of nearshore segments at the "no action" condition. Please review this figure and conclusion and either correct it or explain it.

[25] EPA has no legal basis for requiring remediation in the absence of unacceptable risk. 42 U.S.C §9606(a).

[26] *See*, *Puerto Rico Sun Oil Co. v. U.S. E.P.A.*, 8 F.3d 73, 78 (1st Cir. 1993), citing *Atchison, T & S.F. Ry. Co. v. Wichita Bd. of Trade*, 412 U.S. 800, 808, 93 S.Ct. 2367, 2375, 37 L.Ed.2d 350 (1973) (EPA departure from past practice or precedent must be explained).

[27] *Puerto Rico Sun Oil Co*. 8 F.3rd at 77 ("Unexplained discrimination" by an agency is arbitrary and capricious).

[28] *Portland Harbor Human Health Risk Assessment Summary* (EPA, August 2013)

[29] *See, e.g., Portland Harbor Draft Feasibility Study* (LWG, March 30, 2012), Appendix HA, Table 3.2-9 (Summary of of Biodegradation Rates Applied in the Final Calibrated Fate Model)

[30] EPA FS, Table 2.2-5. The ROD PCB cleanup level of 9 µg/kg is based on background. ROD, Table 17.

[31] ROD, Table 21.

potentially responsible parties requires transparency into EPA's basis for selecting remedial areas and technologies; the absence of such transparency will further complicate the already extraordinarily difficult task of reaching such an allocation at this site without litigation and further delay in the cleanup.

Requested revision: EPA's June 2016 FS evaluations demonstrate that nearshore PAH RALS as high as 170,000 µg/kg would meet the ROD interim target for RAO 1 of 1 x 10^{-5} throughout the site.[32] *Revising the PAH RALs proportionally to the updated cleanup levels would be consistent with the FS and the ROD, which explicitly incorporate MNR as a component of RAO 1 remedies.*

2. <u>EPA's updated cPAH cleanup level based upon risks from consumption of clams harvested in the navigation channel is not a basis for retaining the 170,000 µg/kg PAH RAL</u>

As we have previously commented to EPA, EPA's BHHRA found no risk to humans from clams harvested in the navigation channel.[33] EPA explicitly assumed in the BHHRA that clam harvesting occurred only in nearshore areas: "EPA acknowledges that an appropriate exposure area should be determined in consideration of water depth (i.e., nearshore areas) and the area over which a sustainable shellfish harvest consistent with the clam consumption is possible."[34] EPA has never explained why it abandoned this finding in the ROD, and EPA's application of a cPAH sediment cleanup level for clam consumption in areas of the river in which the BHHRA found no clam consumption risk is inconsistent with the NCP and arbitrary and capricious.[35]

In the ROD, EPA chose to evaluate protectiveness for RAO 2 (fish and shellfish consumption) against an interim target (post-construction) of 1 x 10^{-4} site wide cancer risk.[36] The selected remedy, Alternative F-MOD, was determined protective of RAO 2 at a post-

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[32] ROD, Appendix IV Table J2.2-1c (Alternative B). We also calculated cumulative risk using the updated RAO 1 cPAH cleanup level based upon a 170,000 µg/kg nearshore PAH RAL. Maximum cumulative RAO 1 risk at construction completion was 7.E – 06 at RM 5.3W.

[33] See *Portland Harbor Baseline Human Health Risk Assessment* (EPA April 2013) ("BHHRA"), Appendix F, Map 5-4.1 (Risks from Clam Consumption, RME).

[34] EPA Comments on Comprehensive Round 2 Site Summary and Data Gaps Analysis Report (January 15, 2008), p. 26.

[35] EPA must "explain the key assumptions that underpin its remedy." *Emhart Industries, Inc. v. New England Container Company, Inc.*, 274 F. Supp.3d 30, 48 (D.R.I. 2017) (citations omitted) (finding EPA assumptions concerning use of groundwater and risks from fish consumption on which remedy selection was based arbitrary and capricious). An agency "must offer a 'reasoned explanation' when its current course 'rests upon factual findings that contradict those which underlay' a previous course." *Humane Society of U.S. v. Locke,* 626 F.3d 1040, 1049 (9th Cir. 2010) (NMFS finding that sea lion predation rate of 1 percent had a significant negative impact on recovery of listed salmonid populations arbitrary and capricious without explanation of prior findings that fishery takes of up to 17 percent had no significant adverse effect on salmonid populations). EPA's shifting positions on the clam consumption pathway are discussed in detail in Proposed ESD Appendices A4 and A16.

[36] ROD Table 22 ("Overall Protectiveness … Risk at Construction Completion (Interim Target) [IT]) … Site Wide Human Heath (HH) … RAO 2: IT for cancer risk: 1x10^{-4}")

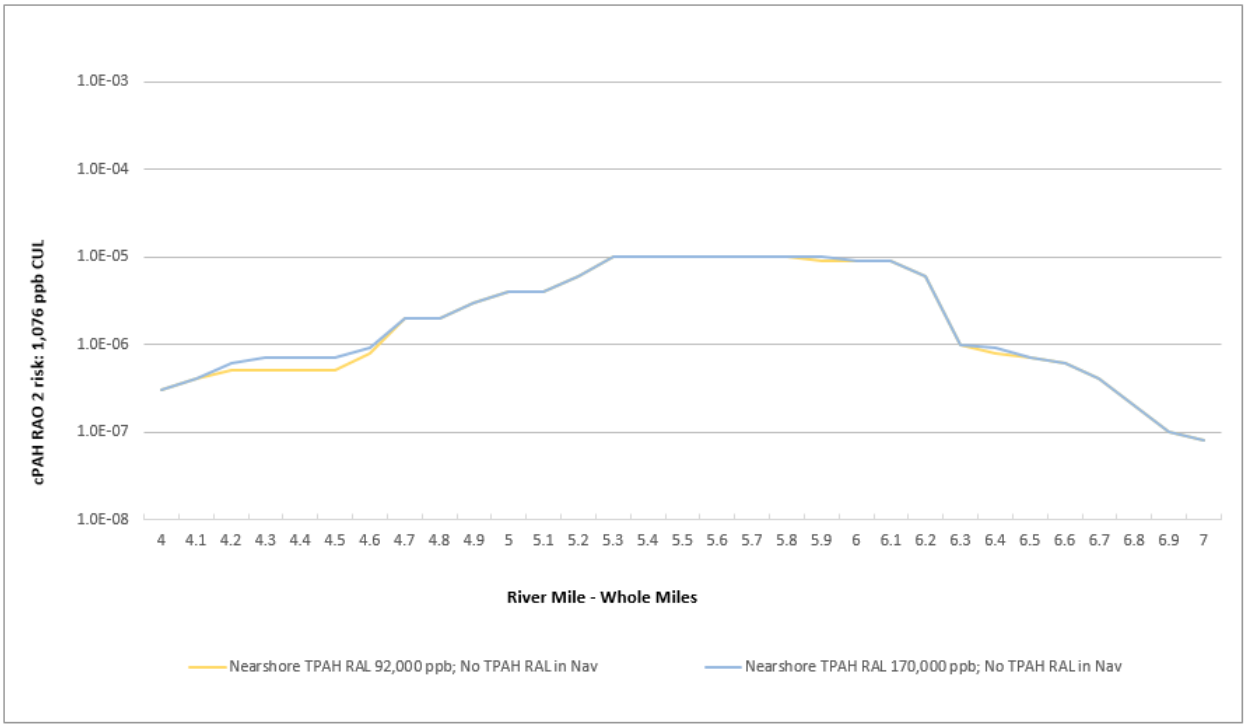
construction risk of 1.5 x 10^{-4}.[37] As described above, EPA explicitly determined that "further reductions [will] be achieved through MNR." [38]

In the proposed ESD, EPA determined that the RAO 2 cPAH cleanup level should be updated to 1,076 µg/kg but did not provide any evaluation of whether the 170,000 µg/kg PAH RAL applicable to the navigation channel was necessary or appropriate to achieve the interim target for RAO 2. The proposed ESD simply notes that the 170,000 µg/kg PAH RAL results in a "maximum post construction risk to human health based on the shellfish consumption exposure pathway of 3 x 10^{-6} as measured on a rolling river mile basis. Based on this post-construction risk level, EPA has determined that the total PAH RAL of 170,000 µg/kg applicable to the navigation channel should not be revised."[39] EPA does not appear to have evaluated various alternative PAH RALs against the interim target in consideration of the updated cleanup value; it simply concluded that its existing RALs would be adequately protective.

In fact, EPA's calculation of sitewide cPAH concentrations at the "no action" condition (1489.1 µg/kg)[40] would yield risks calculated using the updated cleanup level (1,076 µg/kg) of 1 x 10^{-6}, using the same rounding conventions as the ROD . Certainly, cPAH risks, if any,[41] are so far below the interim target of 1 x 10^{-4} that they contribute little, if anything, to attainment of the interim target. As shown in the figure below, cleanup in nearshore areas to even the least conservative PAH RAL considered in EPA's FS (170,000 µg/kg) would result in potential risks from clam consumption well below the interim target as calculated on the whole river mile scale evaluated in the BHHRA without any active PAH cleanup in the navigation channel.[42]

[37] ROD Table 22
[38] EPA FS, p. 4-6.
[39] Proposed ESD, p. 26.
[40] ROD, Appendix IV, Table J2.3-7
[41] Biota-sediment accumulation regression analysis showed only a weak relationship between benzo(a)pyrene in sediment and clam tissue. *Portland Harbor RI/FS Bioaccumulation Modeling Report*, Revised Draft (LWG, June 19, 2015), p. 15, Table 4-1.
[42] Figure shows residual risk calculated on a whole river mile basis, the smallest scale evaluated in the BHRRA for consumption scenarios not limited by water depth. See BHHRA §3.4.5.

Post Construction Clam Consumption Risk
RM 4-7 Whole River Miles
Log Scale



Again, EPA appears to have determined that natural recovery has no role in addressing cPAH risks associated with shellfish consumption, but only for cPAHs and for no other chemical presenting unacceptable risk at Portland Harbor.[43] Such a decision would amount to a fundamental change to a basic feature of the ROD and must be made by a ROD amendment, subjected to evaluation of the nine remedy selection criteria, and adequately explained.

As discussed above, it may be that EPA has concluded that navigation channel PAH RALs remain necessary to capture risk associated with other chemicals and other RAOs. If this is the case, EPA should explicitly state this rationale for the PAH RALs and show its work.

Requested revision: EPA's ROD is flexible enough to support the use of institutional controls in place of dredging or capping based upon land use.[44] The ESD could confirm the findings of the EPA risk assessment that clam harvesting is unlikely to occur in deep water areas and state explicitly that institutional controls could be used to prohibit harvesting of any clams that may be present within the navigation channel, obviating the need for expensive and disruptive dredging on the basis of this hypothetical and undocumented exposure pathway.[45]

[43] "Unexplained discrimination" by an agency is arbitrary and capricious. *Puerto Rico Sun Oil Co*. 8 F.3rd at 77.
[44] ROD, page 106.
[45] The Asian clam, the predominant species found in Portland Harbor, is an invasive, non-native species that is already illegal to harvest or possess in Oregon. *See,* BHHRA p. 29; OAR 635-056-0050(f)(A)(i).

3. Oregon Water Quality Standards do not justify the PAH RALs identified in the proposed ESD.

The proposed ESD states, "The BaP [cancer slope factor] change is not expected to result in a change to Oregon water quality standards in the foreseeable future. As a result, the ARAR based surface water CULs specified in Table 17 of the ROD have not been modified."[46] The most stringent benzo(a)pyrene Oregon water quality standard (human health water + organism consumption) is .0013 µg/l.

In the ROD, EPA evaluated protection of human health risk related to surface water (RAO 3) against an interim target of 10 times the cleanup level.[47] EPA calculated maximum predicted cPAH surface water concentrations at the "no action" level at just over .0012 µg/l.[48] EPA has calculated the average Site cPAH concentration at "no action" at 0.0008 µg/l.[49]

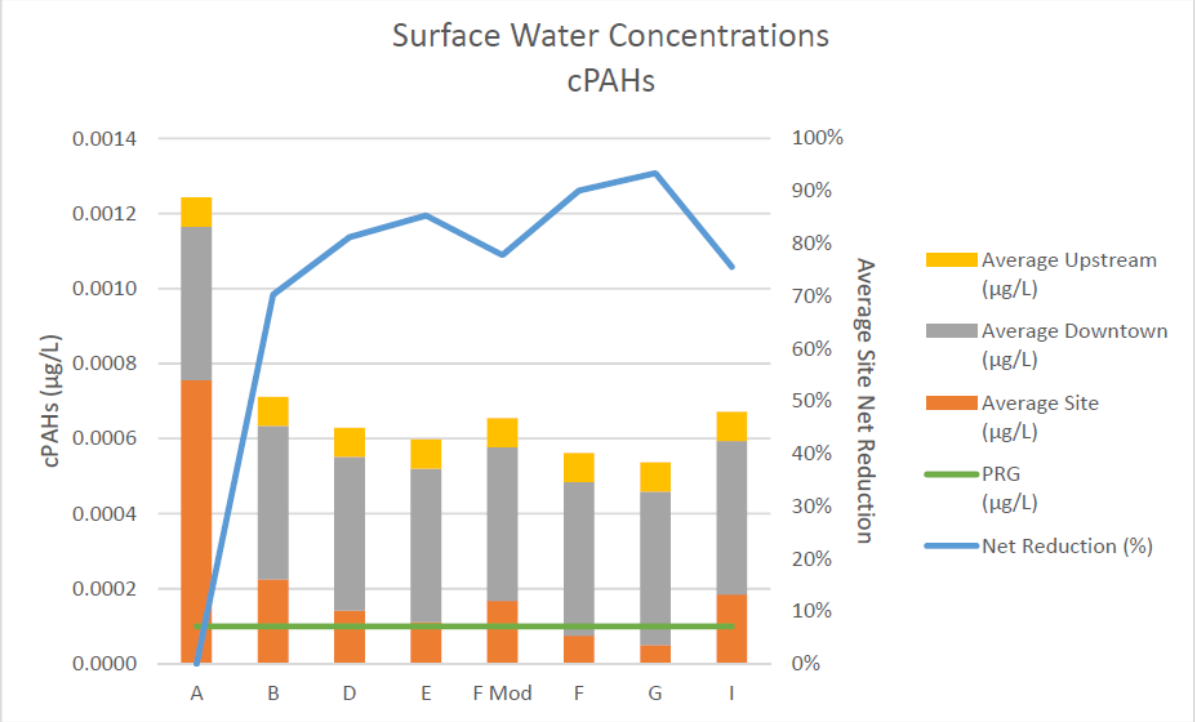


Figure 4.2-8b. Predicted surface water cPAH concentration reductions.

This is below the Oregon water quality standard.

ROD Table 17 sets the cPAH surface water cleanup level at .00012 µg/l based not on the Oregon water quality standard but on the National Recommended Water Quality Criteria for benzo(a)pyrene. NRWQC are not applicable to CERCLA cleanups but may be relevant and

[46] Proposed ESD, page 25.
[47] ROD, Table 10.
[48] ROD Appendix IV, Figure 4.2-8b.
[49] EPA FS, Table K3-4a.

appropriate at some sites. EPA guidance provides, "Prior to using an FWQC for a particular constituent, RPMs should consult the IRIS data base ... to ensure consideration of the latest available scientific information."[50] The .00012 µg/l benzo(a)pyrene NRWQC, which is based on outdated cancer slope factors, no longer represents good science and is no longer relevant or appropriate to RAO 3 (reduce cancer and non-cancer risks to people from surface water at the site).[51]

Requested revision: EPA should update the cPAH cleanup level in ROD Table 17 to the applicable Oregon water quality standard. Because EPA's analysis shows this standard is met at the no action level, no PAH cleanup is necessary to meet RAO 3.

4. The proposed ESD's definition of areas of active remedy specifically to address potential benthic risk is a fundamental change from the ROD

The ROD did not use RALs to define areas of active remedy based on benthic risk. Instead, EPA evaluated benthic risk against an interim target of 50% of the areas of the Site exceeding 10 times the RAO 5 cleanup levels.[52] EPA determined that "if 50 percent was addressed through active remediation, the other 50 percent would be addressed through MNR."[53]

The PAH cleanup level for RAO 5 is 23,000 µg/kg; 10 times the RAO 5 PAH cleanup level is 230,000 µg/kg. In the proposed ESD, EPA "determined that the total PAH RAL of 170,000 µg/kg applicable to the navigation channel should not be revised because it may affect the ability of the Selected Remedy to achieve the total PAH CUL of 23,000 µg/kg for protection of the benthic community (RAO 5)."[54] A January 11, 2018 EPA presentation titled "Changes to the Portland Harbor Remedy based on Updated Human Health Toxicity Values for Benzo(a) Pyrene" states that "increasing the total PAH RAL to 230,000 µg/kg (10x the total PAH Benthic CUL) … may not achieve the ROD specified protectiveness standards" for RAO 5.[55] This is patently incorrect as a matter of simple math. PAH RALs of 230,000 µg/kg or less will remove 100% of areas exceeding 10 times the RAO 5 cleanup levels, surpassing the ROD interim target by a factor of at least two and eliminating any role for MNR in the cleanup.

The proposed ESD justifies this far more aggressive petroleum cleanup than selected in the ROD based on "the lack of natural recovery processes within the navigation channel

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[50] *ARARs Q's & A's: Compliance with Federal Water Quality Criteria* (EPA, June 1990)
[51] We note that ROD Figure 4.2-8b suggests that the EPA's interim target of 10 times the cleanup level could also be met through less conservative cPAH RALs even based upon the outdated NWRQC. Maximum surface water concentrations at the "no action" condition just exceed the .0012 µg/l cPAH interim target. We do not see that EPA undertook any evaluation of the effect of less aggressive active remedies on attainment of the cPAH interim target. Again, EPA appears to have eliminated any role for natural recovery in reducing surface water risks from cPAHs.
[52] ROD, Table 22.
[53] ROD Responsiveness Summary, page 2-217.
[54] Proposed, ESD, page 27
[55] Proposed ESD, Appendix A5, Slide 5.

between RM5 and RM 7 where the total PAH RAL is exceeded."[56] In reaching this conclusion, EPA reviewed bathymetric surveys between 2002 and 2009 as well as "sediment grain size, the potential for propeller wash induced erosion, the ratio of subsurface to surface sediment concentrations, and the erosion potential associated wind and vessel wake generated waves."[57] It is unclear what, if any, information EPA reviewed that was not available to EPA prior to the January 2017 ROD and that drove it to reverse its finding in the ROD that "natural recovery would be effective over most of the Site, except it was less certain in RMs 6-8, and may not occur in RM 11.8-11 and Swan Island Lagoon."[58] We do know that an additional site-wide bathymetry survey was performed in 2018, and the results[59] show large areas of variable thickness of deposition in RM 5-7 based on comparison to the 2004 surveys. In addition, significant additional surface sediment data was recently collected between RM 5-7, which would impact the subsurface to surface sediment concentration line of evidence results. At a minimum, EPA should review this available existing information and update the multiple lines of evidence evaluation results regarding natural recovery throughout RM 5-7 before making such a fundamental change to the remedy selected in the ROD.

EPA also does not explain why it abandoned its decision in the ROD to evaluate protection of the benthic community using an order of magnitude greater than the 23,000 µg/kg PRG "based on the conservativeness of the sediment quality values used in the [baseline ecological risk assessment] models" and its decision to set the interim target at 50 percent reduction of the area posing benthic risk "because protection of the benthic community is based on a population rather than individual effects, and is considered a target to which the benthic population as a whole can be stressed and still recover."[60] Nor does EPA address its apparent rejection of its "further risk management decisions that the entire area above the RAO 5 PRGs did not need to be addressed through capping and dredging .... Since benthic effects from contaminated sediment are due to reproduction and growth, not just survival, this approach would also ensure that the entire population was not diminished through active remediation (capping and dredging is assumed to kill benthic organisms where it occurs)."[61]

This is a fundamental change in the ROD in that it eliminates monitored natural recovery as a component of RAO 5 remedies, at least in areas where PAH RALs can be applied, and should have been undertaken through an amendment to the ROD. If it had done so, EPA's failure to provide any of its reasons for abandoning the protectiveness criteria on which it based its original selection of a remedy and to explain the complete reversal of its previous position on the effectiveness of natural recovery in this area of the river would have been arbitrary and capricious.

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[56] Proposed ESD, page 27
[57] *Id*.
[58] ROD, page 67
[59] David Evans and Associates, Willamette River, Oregon. River Mile 1.9 to 11.8 Hydrographic Survey Report. Prepared for the Pre-RD AOC Group (July 2018), p. 19.
[60] ROD Responsiveness Summary, page 2-217.
[61] *Id.*

The effect of this fundamental change is to require petroleum cleanups to assume a grossly disproportionate share of the burden of addressing RAO 5 among the 87 chemicals determined to present potentially unacceptable risk to benthic invertebrates. Using surfaces generated consistent with EPA ROD methodology, we calculate a total of 117 acres exceed 10 times the RAO 5 cleanup levels for all chemicals. Our mapping shows that approximately 30 acres of the site exceed the 10x RAO 5 PAH cleanup level (approximately 26% of the 117 total acres).

RAO 5 10x areas

Under the proposed ESD, which would apply PAH RALs ranging from 30,000 µg/kg to 170,000 µg/kg, active remedies will address 69% of the 117 acres exceeding 10 times benthic cleanup levels, or about 81 acres.[62] PAH RALs would therefore remove 37% (30 of the 81 acres) of the benthic risk area addressed by active remedies, even though PAHs are responsible for only 26% of the total area exceeding 10 times the RAO 5 PRGs. Put another way, using the RALs in the proposed ESD, active petroleum remedies would remove approximately 124% of the PAH share of the RAO 5 interim target. This may be EPA's strategy for mitigating benthic risk presented by chemicals other than PAHs, but if so EPA should state so explicitly and explain its decision that the burden of this remedy should fall on petroleum sources.

The PAH RALs developed to define active remedies based on RAOs 1 and 2 were never intended to target RAO 5 risks.[63] As EPA's proposed ESD demonstrates, increasing the

[62] Proposed ESD, p. 29.

[63] EPA's PAH RALs for requiring active remediation are not based on benthic risk PRGs (ROD Responsiveness Summary, page 2-216), but this is clearly the reason the proposed ESD now seeks to

nearshore PAH RAL from 13,000 µg/kg to 30,000 µg/kg reduces the area of the site meeting the 50% of 10 times the cleanup level interim target from 72% to 69%, while still removing more than 100% of the area exceeding 10 times the PAH RAO 5 cleanup level (because both nearshore and navigation channel RALS are less than 230,000 µg/kg). The more the PAH RAL is adjusted proportionate to the RAO 1 cleanup level on which it was based, the wider this gap becomes, because smaller PAH SMAs fail to capture areas that exceed 10 times the cleanup level for other chemicals. This disconnect is also apparent in the difference between the finding of the BERA that 4% to 8% of the Site presents potential benthic invertebrate risk and the conclusion of the FS that such risks are present across approximately 59% of the site.[64] Plainly, there is no rational connection between the RALs and RAO 5.[65]

Requested revision: EPA should not apply PAH RALs in the navigation channel on the basis of RAO 5. The existing ROD contains the flexibility to allow for delineation during remedial design of areas where RAO 5 is driving cleanup based on the multiple lines of evidence, including toxicity testing, used in the BERA.[66] For all of the reasons discussed above, protection of benthic invertebrates is the only potential basis consistent with the baseline risk assessment for active PAH remedies in the navigation channel. At a minimum, the proposed ESD should clarify that, during remedial design, active remediation of benthic toxicity areas in the navigation channel may be defined using the multiple lines of evidence approach rather than through strict application of PAH RALs.

5. Please clarify or correct a few apparent errors in the proposed ESD

    a. Proposed ESD Figure 3 does not appear to have been updated with the new PAH PTW-Highly Toxic contours. Please update this figure.

    b. Proposed ESD Figure 8 correctly labels the Gasco site in large bolded type, but also includes a small label to the north that incorrectly identifies the Corps of Engineers US Moorings facility as "Gasco." Please remove this small label.

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retain them in the navigation channel. EPA's ROD originally established the RAO 2 cleanup at 3,950 µg/kg. Based upon the IRIS cancer slope factor, that cleanup level would have increased to 107,600 µg/kg. At this cleanup value, EPA concluded that "remediation of PAH contaminated sediments within the Navigation Channel is not required to protect human health based on the clam consumption exposure scenario (RAO 2)." EPA, *Evaluation of Potential Modifications to Total PAH Navigation Channel RAL,* Proposed ESD at .pdf page 274. Still, EPA decided to retain the PAH RALs because of its concern about the ability of MNR in the channel to achieve RAO 5. *Id*. at page 275. EPA later discovered an error in calculation of the original clam consumption PRG and reinserted RAO 2 as a justification for the navigation channel RAL. As discussed above, however, RAO 2 simply does not support navigation channel PAH RALs.

[64] ROD, p. 49; ROD Appendix IV, Table 4.2-7 (1289 acres benthic risk area) and p. 1 (Site is 2190 acres).

[65] An agency decision is arbitrary and capricious unless it is "founded on a rational connection between the facts found and the choices made." *Arizona Cattle Growers' Ass'n v. U.S. Fish & Wildlife, Bureau of Land Mgmt*, 273 F.3d 1120, 1243 (9th Cir. 2001) (finding incidental take statement arbitrary and capricious based on speculation that razorback sucker may be present on property when it had no evidence that the sucker "even exists anywhere in the area.").

[66] See, ROD Responsiveness Summary, p. 2-218

c. Proposed ESD Figure 6 showing the TPAH RAL curve should be updated to reflect the updated direct contact cleanup level.

d. Proposed ESD Appendix A1 “ROD Table 17 Updated for ESD” shows the incorrect basis for cPAH sediment CUL; it shows “B” indicating background based, but it should be "R" indicating risk-based.

e. Proposed ESD page 24 indicates there is a recreational beach at RM 5.9W when there is not. Please correct this reference.

CONCLUSION

NW Natural thanks you for your consideration of these comments. We hope that EPA will (1) increase nearshore PAH RALs proportionally to the updated cPAH RAO 1 cleanup level; (2) eliminate navigation channel PAH RALs or clarify that institutional controls may be used in lieu of active remedies to prevent shellfish consumption from the navigation channel while the Site naturally recovers; (3) update Table 17 to reflect the Oregon water quality standard for benzo(a)pyrene as the RAO 3 cleanup level; and (4) confirm that areas of potential benthic risk from PAHs in the navigation channel may be defined using multiple lines of evidence, including benthic toxicity testing.

If you have any questions concerning these comments, please do not hesitate to contact me.

Sincerely,

Robert J. Wyatt

cc: Jim Woolford, EPA Headquarters
Sheryl Bilbrey, EPA Region 10
Sean Sheldrake, EPA Region 10
Lori Cora, EPA Region 10